

PATENT ABSTRACTS OF JAPAN

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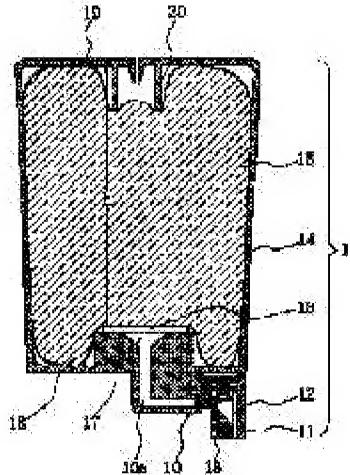
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(54) INK TANK AND METHOD FOR ATTACHING FILTER TO INK TANK

(57)Abstract:

PURPOSE: To provide a filter attaching method of good productivity by forming a supporting section for supporting a peripheral section of a filter in the unfixed state on the end of a feed line of an ink feed opening supported by a compressive porous member and providing a deformation control member for bringing the porous member into contact by means of elastic deformation force of the porous member.

CONSTITUTION: A filter 16 is placed on a filter supporting section 18 in the position where it covers the upper face of an ink jet section 17 communicating with a top plate 13 formed in an ink tank 14, and so fixed as to be brought into contact with the ink feed opening in the ink tank 14 in a state that it is pressed by the compressive porous member 15. At that time, the fixing process of bonding, welding or the like of the filter 16 to the ink tank 14 is not required. The pressurized state in the contacting direction of the porous member 15 is retained by a wall 19 of the ink tank facing the filter supporting section 18 serving as a filter mounting section, and the wall 19 is functioned as a main deformation control section for the porous member 15. A clearance is not formed in a section where the porous member 15 is in contact with the filter 16.



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CLAIMS

[Claim(s)]

[Claim 1] In the ink tank which holds the ink for supplying a record means The ink feed hopper for supplying the ink held at the compressible porosity member and this porosity member for holding ink to said record means, The ink supply way which makes this ink feed hopper and a porosity member open for free passage, and the filter prepared in the edge of this ink supply way, The ink tank characterized by having the filter supporter which supports the periphery of this filter in the state of un-fixing, and the deformation specification-part material of the porosity member to which the pressure welding of said filter is carried out to said filter supporter according to the elastic-deformation force of said porosity member.

[Claim 2] It is the ink tank according to claim 1 characterized by for said filter supporter having a lobe for regulating the location of said filter, and there being few amounts of protrusions of this lobe than the thickness of said filter.

[Claim 3] The ink tank according to claim 1 characterized by allotting an annular elastic member between said filter supporters and said filters.

[Claim 4] The filter means of attachment which lay a filter in the filter supporter which is the filter means of attachment for the ink tank which has an ink feed hopper for supplying ink to a record means, and is open for free passage to said ink feed hopper, insert the porosity member for holding ink into an ink tank, compress this porosity member, make carry out the pressure welding of said filter to said filter supporter by the elastic-deformation force over this compression, and are characterized for said filter by attachment ***** at said filter supporter.

[Claim 5] Filter means of attachment according to claim 4 characterized by laying said filter where an annular elastic member is filter minded [said].

DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention holds the ink for supplying ink to a record means to form discharge and an image, according to image information from two or more orifices to recorded media, and about the filter means of attachment for the ink tank and this ink tank which have a filter, in order to hold ink especially, it relates to the filter means of attachment for the ink tank and this ink tank which use a porosity member.

[0002]

[Description of the Prior Art] Since the method which records an image etc. using the record means which carries out the regurgitation of the ink can manufacture a recording device cheaply comparatively, it is in use in recent years. Using an ink jet head as a record means, this method is carrying out the regurgitation of the drop to recorded media according to image information from two or more orifices, and forms an image.

[0003] As for this ink jet head, it is common to be constituted by two or more nozzles which are open for free passage to said two or more orifices, said two or more nozzles, the common liquid room which is open for free passage in common, and the ink tank which supplies ink to said common liquid room. Moreover, from a viewpoint of the miniaturization of a record means, into said two or more nozzles, it considers as the energy generation object which carries out the regurgitation of the drop, and an exoergic resistor is prepared in many cases.

[0004] And it is considering as the configuration which forms a means to make the ink tank which supplies ink to an ink jet head generate back pressure to a record means in order to prevent the ink leakage from the orifice which carries out the regurgitation of the ink in the interior.

[0005] The configuration which allots the porosity member used as porosity to the ink hold section is mentioned so that the held ink may form a meniscus and may generate back pressure as this back pressure generating means. In addition, this back pressure generating means is usually called a negative pressure generating means, when making the pressure condition in a record means into negative pressure to a condition lower than atmospheric pressure, i.e., atmospheric pressure.

[0006] Although a porosity member is used as a negative pressure generating means in many cases as mentioned above, since possibility of a detailed piece coming out from a porosity member in this case, and blending in the ink currently held is high, the purpose which removes usual dust etc. will also be united and a filter will be prepared into the ink derivation path to the exterior. This filter can protect that detailed dust etc. invades into a record means side, and it can control causing the blinding in a discharge part.

[0007] The ink feed hopper section for supplying ink to a record means in the interior of an ink tank was equipped with this filter, and it welded the filter by melting the height prepared in the part which contacts the filter supporter which supports a filter to the perimeter of a filter with heat or a supersonic wave.

[0008] Moreover, as an approach for raising the adhesion of the fixed part of the filter section, as shown in JP,6-39164,B, the approach of putting by the filter supporter and filter presser-foot member in which the filter was prepared by the ink tank, making carry out melting of the both sides, and fixing is also proposed.

[0009]

[Problem(s) to be Solved by the Invention] However, in the conventional example mentioned above, since a filter was fixed and the technique of joining was used, technical constraint of being limited to the polymeric materials in which the quality of the material of the ink tank by which the height for joining is constituted has the optimal **** plasticity for joining by heat or the supersonic wave had arisen.

[0010] Moreover, when it was the ingredient with which fillers, such as glass and a metal, are mixed, since wear of a joining terminal, YAKE, etc. occurred at the time of joining by heat or the supersonic wave, the technical problem that stable production could not be performed occurred.

[0011] Furthermore, in order to require fixed time amount at the time of joining, the production time was long, and there was fear of a cost rise.

[0012] In addition, when it fixes a filter by joining, in order to prevent invasion of air bubbles etc. from the gap resulting from the float of the filter from a filter supporter etc., it is necessary to perform joining of the perimeter of a filter certainly.

[0013] For this reason, in a filter periphery, rather than the filter front face as for which a filter and a porosity member carry out a pressure welding, it becomes the configuration that a welding projects, in many cases, and a gap will be generated between porosity members in a filter periphery in this case. Since the gap between this filter and a porosity member serves as a field in which air bubbles etc. tend to pile up, it has a possibility that stable supply of ink may become difficult by reduction of the diameter of effective passage at the time of ink supply, fluctuation of the ink amount of supply, etc.

[0014] It is in the purpose of this invention offering the means of attachment of the ink tank with good productivity whose ink supply engine performance in which solve the above-mentioned trouble and the ink tank quality of the material is not limited was stable, and the filter to this ink tank.

[0015]

[Means for Solving the Problem] In the ink tank which holds the ink for supplying a record means in order that this invention may solve the technical problem mentioned above The ink feed hopper for supplying the ink held at the compressible porosity member and this porosity member for holding ink to said record means, The ink supply way which makes this ink feed hopper and a porosity member open for free passage, and the filter prepared in the edge of this ink supply way, It proposes considering as the configuration which has the filter supporter which supports the periphery of this filter in the state of un-fixing, and the deformation specification-part material of the porosity member to which the pressure welding of said filter is carried out to said filter supporter according to the elastic-deformation force of said porosity member.

[0016] And in addition to the above-mentioned configuration, it has a lobe for regulating the location of said filter to said filter supporter, and the configuration which an annular elastic member allots between the configuration which makes the amount of protrusions of this lobe fewer than the thickness of said filter, or said filter supporter and said filter is proposed.

[0017] moreover, as filter means of attachment for the ink tank which has an ink feed hopper for supplying ink to a record means in addition to the above-mentioned configuration Lay a filter in the filter supporter which is open for free passage to said ink feed hopper, insert the porosity member for holding ink into an ink tank, and this porosity member is compressed. The pressure welding of said filter is carried out to said filter supporter by the elastic-deformation force over this compression, and ***** filter means of attachment also propose said filter to said filter supporter.

[0018] And the approach which added the process which lays said filter where an annular elastic

member is further filter minded [said] to the above-mentioned approach is also proposed.

[0019]

[Function] By using the means mentioned above, without using joining, the pressure welding of the attachment of the filter to an ink tank can be carried out to a filter supporter, and a porosity member can stick it certainly with the whole interior side front face of an ink tank of a filter further.

[0020]

[Example] A drawing is used for below and the example of this invention is explained to it at a detail. In addition, in each drawing, the element which attached the same sign shall have the same or same function.

[0021] Drawing 1 is the outline external view showing an example of an ink jet recording device which has the ink hold section concerning this invention. In drawing 1 , 1 is the ink jet head equipped with the ink hold section which has a filter. 2 is carriage which places a delivery side upside down and fixes the ink jet head 1.

[0022] Moreover, 3 is recorded media with which record is performed, and uses the recording paper in this example. This detail paper 3 is conveyed by the platen 4 to the scanning direction and perpendicular direction of the ink jet head 1. 5 and 6 are the shafts for scanning carriage 2, and carriage 2 moves them by rotation of 5.

[0023] And 7 is a wrap cap about the delivery side of the ink jet head 1, and it is constituted so that a delivery side may be covered during standby of the ink jet head 1 at the time of unprinting. 8 is a pump for attracting ink from two or more orifices in the ink jet head 1 through cap 7.

[0024] By the ink jet recording apparatus with the above configurations, an image is formed on the detail paper 3 by carrying out the regurgitation of the drop from two or more orifices in the ink jet head 1.

[0025] (The 1st example) The sectional view of the ink jet head which has a record means and the ink hold section is shown in drawing 2 as the 1st example of this invention. In drawing 2 , 12 is a heater board on which two or more heaters which are the energy generation section for forming a drop are formed. 13 is a top plate which has in the interior the common liquid room which is open for free passage for two or more nozzles and said two or more nozzles, and the ink feed hopper which is further open for free passage in said common liquid room. 11 is a substrate and the heater board 12 and the top plate 13 are being fixed on the substrate 11.

[0026] And the drop formation section which breathes out a drop from two or more orifices to the recorded media as a record means, and forms an image with a substrate 11, the heater board 12, and a top plate 13 is constituted.

[0027] Moreover, 14 is an ink tank as the ink hold section for supplying and holding ink in said drop formation section. 10 is an ink feed hopper for deriving the ink of ink hold circles to an ink hold outside. It has the filter 16 which has the function to remove the dust in said ink so that it may be located in the edge of ink supply way 10a which makes the compressed porosity member 15 with the function to generate negative pressure and to hold ink, and the ink feed hopper 10 open for free passage, as mentioned above, in the ink tank 14.

[0028] Here, the porosity member 15 is formed by inserting it into the ink tank 14, compressing the porosity member which is the elastic body which used the quality of the material of urethane or a melamine system. Moreover, a filter 16 presses the bulk of the mesh filter which knit the thin line of plane SUS, or the thin line of SUS, and the sintered filter is used.

[0029] The filter 16 is put on the filter supporter 18 used as a wrap location in the top face of the

ink feed hopper section 17 which is open for free passage to a top plate 13 formed in the ink tank 14, and it is being fixed so that it may be close to the ink feed hopper in the ink tank 14 in the state of pressurization with the porosity member 15 into which the above was compressed. Under the present circumstances, there are no fixing processes, such as adhesion with the ink tank 14 of a filter 16 and joining.

[0030] Moreover, the filter supporter 18 is also carrying out the same flat-surface configuration as a filter 16, and it has the bigger path than the diameter of a filter. This is for making a pressure condition uniform over the field which carries out a pressure welding to the filter 16 of the porosity member 15, and he is trying for compression distribution of a porosity member not to change especially in a filter periphery.

[0031] Here, the porosity member 15 has the composition that the pressure condition of the direction of a pressure welding is maintained with the wall 19 of the ink tank which counters the filter supporter 18 which is the filter attachment section. Therefore, in this example, the wall 19 is functioning as main deformation specification-part material of the porosity member 15.

[0032] Moreover, as shown in drawing, it considers as the configuration which makes the filter supporter 18 project inside an ink tank, and the porosity member 15 is allotted and the filter 16 is pressed so that the whole lobe may be covered.

[0033] And although this pressurization condition is adjusted by the content volume of the ink tank 14, and the magnitude of the porosity member 15 Since it is compatible in stable negative pressure generating and location immobilization of a filter 16, if distance to the wall which counters from the pressure-welding side of the porosity member 15 and a filter 16 is set to h thrust [as opposed to a filter 16 considering the width of face of the same direction (or filter press shaft orientations) of the porosity member 15 as within the limits of 1.5h-6h] -- 3000 - 15000 N/m² ** -- carrying out is desirable. It is 7500Ns/m² to a filter 16, using width of face of the porosity member 15 as 3h in this example. He is trying for thrust to work.

[0034] Moreover, while forming a rib 20 in the wall 19 mentioned above and tuning contact pressure of a filter finely, the vector of the thrust by the elastic-deformation force of the porosity member 15 concerning a filter 16 is regulated so that it may become almost equal to the direction of a normal over the front face of a filter 16. This is adjusting regulation of deformation to the still more suitable condition for ink supply.

[0035] Since a gap is not generated in the pressure-welding section of the porosity member 15 and a filter 16 and the porosity member 15 sticks certainly to a filter 16 by adopting an above-mentioned configuration, when air bubbles gather near the filter, the effective diameter of an ink feeder current way is not decreased.

[0036] Moreover, vibration by fall etc. is added, and in the interior of an ink tank, since a filter 16 is in the condition of not fixing even if the porosity member 15 carries out a very small variation rate under the effect by the self-weight of the ink held inside, in connection with the variation rate, some migration also of a filter 16 is attained on the filter supporter 18. Therefore, possibility that torsion between the porosity member 15 and a filter 16 etc. will not arise, and air bubbles will pile up near the filter 16 by an impact etc. is made with a lower thing.

[0037] (The 2nd example) Drawing 3 is the outline sectional view showing the filter section as the 2nd example concerning this invention. In drawing 3, 31 is the ink feed hopper section for supplying ink to the drop formation section formed in the ink tank. 32 is the compressed porosity member with the function to generate negative pressure and to hold ink which was inserted into the ink tank. 33 is a filter with the function to remove the dust in ink.

[0038] And the porosity member 32 is formed like the 1st example mentioned above by inserting

it into the ink tank 14, compressing the porosity member which is the elastic body which used the quality of the material of urethane or a melamine system. Moreover, a filter 33 presses the bulk of the mesh filter which knit the thin line of plane SUS, or the thin line of SUS, and the sintered filter is used.

[0039] Here, the filter 33 is put on the predetermined location on the filter supporter 38, and it is being fixed so that it may be close to the ink feed hopper in an ink tank in the state of pressurization with the porosity member 32 into which the above was compressed, so that the top face of the ink feed hopper section 31 may be covered.

[0040] Under the present circumstances, the rib 34 which is a lobe for positioning is formed in the perimeter of the upper part of the ink feed hopper section 31, in order to make it the horizontal fixed position of a filter 33 not separate greatly from the core of the ink feed hopper section, and in order to make easy positioning of the filter 33 at the time of assembly. Moreover, in order to make adhesion of a filter 33 good, the thickness of the rib 34 for positioning is set up fewer than the thickness of a filter 33, and the height of a rib 34 is lower than the pressure-welding side front face of a filter 33 as a result.

[0041] Thereby, like the 1st example, the adhesion of a filter 33 and the porosity member 32 is maintained, and can improve the location precision of a filter 33 further.

[0042] And while the variation rate of the porosity member 32 resulting from an impact which was mentioned above by preparing spacing between a lobe 34 and the edge of a filter 33 is permissible, it also becomes possible to hold down the variation rate of a filter 33 to extent which does not affect ink supply.

[0043] (The 3rd example) The attachment gestalt of the filter section as the 3rd example concerning this invention is shown in drawing 4 . In drawing 4 , 41 is the ink feed hopper section for supplying ink to the drop formation section formed in the ink tank. 42 is the compressed porosity member with the function to generate negative pressure and to hold ink which was inserted into the ink tank. 43 is a filter with the function to remove the dust in ink.

[0044] To the filter supporter 48, the filter 43 is put on the wrap location in the top face of the ink feed hopper section 41, and it is being fixed so that it may be close to the ink feed hopper in an ink tank in the state of pressurization with the porosity member 42 into which the above was compressed. Under the present circumstances, in order to make good airtightness with the ink feed hopper section 41 of a filter 43, the plane elastic member 44 which the ink feed zone of a center section was removed and became annular in the upper part of the ink feed hopper section 41 is arranged, and the filter 43 is arranged in the upper part of an elastic member 44. As for an elastic member 44, isobutylene isoprene rubber etc. is used.

[0045] It is desirable to consider as the ingredient which has the properties that an elastic member 44 does not produce plastic deformation, such as an elastic modulus of extent, to the thrust to a filter 43 here.

[0046] Even if the vector of the thrust to the filter 43 by the porosity member 42 shifts temporarily to the direction of a normal over the front face of a filter 43 by forming this elastic member 44 according to external force, such as an impact, airtightness is maintainable until it returns to an initial state.

[0047] (The 4th example) The filter section as other examples concerning this invention is further shown in drawing 5 . This example combines the 2nd example and the 3rd example which were mentioned above, and proposes an airtight good filter attachment gestalt more.

[0048] In drawing 5 , 51 is the ink feed hopper section for supplying ink to the drop formation section formed in the ink tank. 52 is the compressed porosity member with the function to

generate negative pressure and to hold ink which was inserted into the ink tank. 53 is a filter with the function to remove the dust in ink.

[0049] The filter 53 is put on the wrap location in the top face of the ink feed hopper section 51 to the filter supporter 58, and it is being fixed so that it may be close to the ink feed hopper in an ink tank in the state of pressurization with the porosity member 52 into which the above was compressed.

[0050] Under the present circumstances, in order to make good adhesion with the ink feed hopper section 51 of a filter 53, the plane elastic member 54 from which the ink feed zone of a center section was removed is arranged in the upper part of the ink feed hopper section 51, and the filter 53 is arranged in the upper part of an elastic member 54.

[0051] Furthermore, the rib 55 for positioning is formed in the perimeter of the upper part of the ink feed hopper section 51, in order to make it the horizontal fixed position of a filter 53 and an elastic member 54 not separate greatly from the core of the ink feed hopper section, and in order to make easy the filter 53 at the time of assembly, and positioning of an elastic member 54.

Moreover, in order to make adhesion of a filter 53 good, the thickness of the rib 55 for positioning is set up lower than the thickness of a filter 53 and an elastic member 54.

[0052] Thereby, while making high adhesion of a filter 53 and the porosity member 52, it becomes possible to maintain the airtightness between a filter 53 and the filter supporter 58.

[0053]

[Effect of the Invention] As stated above, since a gap is not generated in the pressure-welding section of the porosity member for holding ink, and a filter and a porosity member sticks certainly to a filter, when air bubbles gather near the filter, by this invention, the effective diameter of an ink feeder current way is not decreased.

[0054] Moreover, vibration by fall etc. is added, and in the interior of an ink tank, since a filter is in the condition of not fixing even if a porosity member carries out a very small variation rate under the effect by the self-weight of the ink held inside, in connection with the variation rate, some migration also of a filter is attained on a filter supporter. Therefore, possibility that torsion between a porosity member and a filter etc. will not arise and air bubbles will pile up near the filter by an impact etc. is made with a lower thing.

[0055] And the means of attachment of the filter to the ink tank with high productivity by which the ink tank quality of the material is not limited, and this ink tank are realized, and the adhesion of a filter becomes possible [producing a reliable high ink tank with good dust removal nature] with producing the ink tank of low cost.

[0056] Moreover, since the ingredient with which fillers, such as glass and a metal, are mixed can be used, it also becomes possible to make high reinforcement of the engagement section at the time of making an ink tank dismountable, and to lessen wear of the engagement section at the time of repeating attachment and detachment.

TECHNICAL FIELD

[Industrial Application] This invention holds the ink for supplying ink to a record means to form discharge and an image, according to image information from two or more orifices to recorded media, and about the filter means of attachment for the ink tank and this ink tank which have a filter, in order to hold ink especially, it relates to the filter means of attachment for the ink tank and this ink tank which use a porosity member.

PRIOR ART

[Description of the Prior Art] Since the method which records an image etc. using the record means which carries out the regurgitation of the ink can manufacture a recording device cheaply comparatively, it is in use in recent years. Using an ink jet head as a record means, this method is carrying out the regurgitation of the drop to recorded media according to image information from two or more orifices, and forms an image.

[0003] As for this ink jet head, it is common to be constituted by two or more nozzles which are open for free passage to said two or more orifices, said two or more nozzles, the common liquid room which is open for free passage in common, and the ink tank which supplies ink to said common liquid room. Moreover, from a viewpoint of the miniaturization of a record means, into said two or more nozzles, it considers as the energy generation object which carries out the regurgitation of the drop, and an exoergic resistor is prepared in many cases.

[0004] And it is considering as the configuration which forms a means to make the ink tank which supplies ink to an ink jet head generate back pressure to a record means in order to prevent the ink leakage from the orifice which carries out the regurgitation of the ink in the interior.

[0005] The configuration which allots the porosity member used as porosity to the ink hold section is mentioned so that the held ink may form a meniscus and may generate back pressure as this back pressure generating means. In addition, this back pressure generating means is usually called a negative pressure generating means, when making the pressure condition in a record means into negative pressure to a condition lower than atmospheric pressure, i.e., atmospheric pressure.

[0006] Although a porosity member is used as a negative pressure generating means in many cases as mentioned above, since possibility of a detailed piece coming out from a porosity member in this case, and blending in the ink currently held is high, the purpose which removes usual dust etc. will also be united and a filter will be prepared into the ink derivation path to the exterior. This filter can protect that detailed dust etc. invades into a record means side, and it can control causing the blinding in a discharge part.

[0007] The ink feed hopper section for supplying ink to a record means in the interior of an ink tank was equipped with this filter, and it welded the filter by melting the height prepared in the part which contacts the filter supporter which supports a filter to the perimeter of a filter with heat or a supersonic wave.

[0008] Moreover, as an approach for raising the adhesion of the fixed part of the filter section, as shown in JP,6-39164,B, the approach of putting by the filter supporter and filter presser-foot member in which the filter was prepared by the ink tank, making carry out melting of the both sides, and fixing is also proposed.

EFFECT OF THE INVENTION

[Effect of the Invention] As stated above, since a gap is not generated in the pressure-welding section of the porosity member for holding ink, and a filter and a porosity member sticks certainly to a filter, when air bubbles gather near the filter, by this invention, the effective diameter of an ink feeder current way is not decreased.

[0054] Moreover, vibration by fall etc. is added, and in the interior of an ink tank, since a filter is in the condition of not fixing even if a porosity member carries out a very small variation rate under the effect by the self-weight of the ink held inside, in connection with the variation rate,

some migration also of a filter is attained on a filter supporter. Therefore, possibility that torsion between a porosity member and a filter etc. will not arise and air bubbles will pile up near the filter by an impact etc. is made with a lower thing.

[0055] And the means of attachment of the filter to the ink tank with high productivity by which the ink tank quality of the material is not limited, and this ink tank are realized, and the adhesion of a filter becomes possible [producing a reliable high ink tank with good dust removal nature] with producing the ink tank of low cost.

[0056] Moreover, since the ingredient with which fillers, such as glass and a metal, are mixed can be used, it also becomes possible to make high reinforcement of the engagement section at the time of making an ink tank dismountable, and to lessen wear of the engagement section at the time of repeating attachment and detachment.

TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] However, in the conventional example mentioned above, since a filter was fixed and the technique of joining was used, technical constraint of being limited to the polymeric materials in which the quality of the material of the ink tank by which the height for joining is constituted has the optimal **** plasticity for joining by heat or the supersonic wave had arisen.

[0010] Moreover, when it was the ingredient with which fillers, such as glass and a metal, are mixed, since wear of a joining terminal, YAKE, etc. occurred at the time of joining by heat or the supersonic wave, the technical problem that stable production could not be performed occurred.

[0011] Furthermore, in order to require fixed time amount at the time of joining, the production time was long, and there was fear of a cost rise.

[0012] In addition, when it fixes a filter by joining, in order to prevent invasion of air bubbles etc. from the gap resulting from the float of the filter from a filter supporter etc., it is necessary to perform joining of the perimeter of a filter certainly.

[0013] For this reason, in a filter periphery, rather than the filter front face as for which a filter and a porosity member carry out a pressure welding, it becomes the configuration that a welding projects, in many cases, and a gap will be generated between porosity members in a filter periphery in this case. Since the gap between this filter and a porosity member serves as a field in which air bubbles etc. tend to pile up, it has a possibility that stable supply of ink may become difficult by reduction of the diameter of effective passage at the time of ink supply, fluctuation of the ink amount of supply, etc.

[0014] It is in the purpose of this invention offering the means of attachment of the ink tank with good productivity whose ink supply engine performance in which solve the above-mentioned trouble and the ink tank quality of the material is not limited was stable, and the filter to this ink tank.

MEANS

[Means for Solving the Problem] In the ink tank which holds the ink for supplying a record means in order that this invention may solve the technical problem mentioned above The ink feed hopper for supplying the ink held at the compressible porosity member and this porosity member for holding ink to said record means, The ink supply way which makes this ink feed hopper and a porosity member open for free passage, and the filter prepared in the edge of this

ink supply way, It proposes considering as the configuration which has the filter supporter which supports the periphery of this filter in the state of un-fixing, and the deformation specification-part material of the porosity member to which the pressure welding of said filter is carried out to said filter supporter according to the elastic-deformation force of said porosity member.

[0016] And in addition to the above-mentioned configuration, it has a lobe for regulating the location of said filter to said filter supporter, and the configuration which an annular elastic member allots between the configuration which makes the amount of protrusions of this lobe fewer than the thickness of said filter, or said filter supporter and said filter is proposed.

[0017] moreover, as filter means of attachment for the ink tank which has an ink feed hopper for supplying ink to a record means in addition to the above-mentioned configuration Lay a filter in the filter supporter which is open for free passage to said ink feed hopper, insert the porosity member for holding ink into an ink tank, and this porosity member is compressed. The pressure welding of said filter is carried out to said filter supporter by the elastic-deformation force over this compression, and ***** filter means of attachment also propose said filter to said filter supporter.

[0018] And the approach which added the process which lays said filter where an annular elastic member is further filter minded [said] to the above-mentioned approach is also proposed.

OPERATION

[Function] By using the means mentioned above, without using joining, the pressure welding of the attachment of the filter to an ink tank can be carried out to a filter supporter, and a porosity member can stick it certainly with the whole interior side front face of an ink tank of a filter further.

EXAMPLE

[Example] A drawing is used for below and the example of this invention is explained to it at a detail. In addition, in each drawing, the element which attached the same sign shall have the same or same function.

[0021] Drawing 1 is the outline external view showing an example of an ink jet recording device which has the ink hold section concerning this invention. In drawing 1 , 1 is the ink jet head equipped with the ink hold section which has a filter. 2 is carriage which places a delivery side upside down and fixes the ink jet head 1.

[0022] Moreover, 3 is recorded media with which record is performed, and uses the recording paper in this example. This detail paper 3 is conveyed by the platen 4 to the scanning direction and perpendicular direction of the ink jet head 1. 5 and 6 are the shafts for scanning carriage 2, and carriage 2 moves them by rotation of 5.

[0023] And 7 is a wrap cap about the delivery side of the ink jet head 1, and it is constituted so that a delivery side may be covered during standby of the ink jet head 1 at the time of un-printing. 8 is a pump for attracting ink from two or more orifices in the ink jet head 1 through cap 7.

[0024] By the ink jet recording apparatus with the above configurations, an image is formed on the detail paper 3 by carrying out the regurgitation of the drop from two or more orifices in the ink jet head 1.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the outline external view showing an example of an ink jet recording device which has the ink hold section concerning this invention.

[Drawing 2] It is the outline sectional view of the ink jet head which has the record means and the ink hold section as the 1st example concerning this invention.

[Drawing 3] It is the outline sectional view showing the filter section as the 2nd example concerning this invention.

[Drawing 4] It is the outline sectional view showing the filter section as the 3rd example concerning this invention.

[Drawing 5] It is the outline sectional view showing the filter section as the 4th example concerning this invention.

[Description of Notations]

1 Ink Jet Head

2 Carriage

3 Recording Paper

4 Platen

5 Shaft

6 Shaft

7 Cap

8 Pump

10 Ink Feed Hopper

10a Ink supply way

11 Substrate

12 Heater Board

13 Top Plate

14 Ink Tank (Ink Hold Section)

15 Porosity Member

16 Filter

17 Ink Feed Hopper Section

18 Filter Supporter

19 Wall

20 Rib

31 Ink Feed Hopper Section

32 Porosity Member

33 Filter

34 Rib (Height)

38 Filter Supporter

41 Ink Feed Hopper Section

42 Porosity Member

43 Filter

44 Elastic Member

48 Filter Supporter

51 Ink Feed Hopper Section

52 Porosity Member

53 Filter
54 Elastic Member
55 Rib (Height)
58 Filter Supporter

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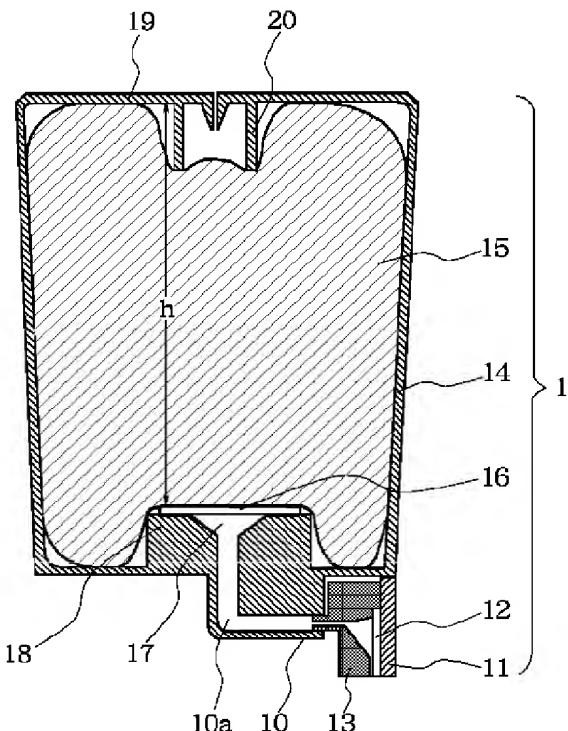
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(54)【発明の名称】 インクタンク及び該インクタンクに対するフィルタの取付方法

(57)【要約】

【目的】 インクタンクの材質が限定されない、インク供給性能の安定した、生産性の良好なインクタンク及びこのインクタンクへのフィルタの取付方法を提供することにある。

【構成】 インクを保持するための圧縮可能な多孔質部材15と、この多孔質部材15に保持されたインクを前記記録手段へ供給するためのインク供給口10と、このインク供給口10と多孔質部材15とを連通させるインク供給路10aと、このインク供給路10aの端部に設けられたフィルタ16と、このフィルタ16の周辺部を非固着状態で支持するフィルタ支持部18と、前記多孔質部材15の弾性変形力により前記フィルタ16を前記フィルタ支持部18に対して圧接させる多孔質部材の変形規制部材19と、を有するインクタンクである。



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【特許請求の範囲】

【請求項1】 記録手段に供給するためのインクを収容するインクタンクにおいて、
 インクを保持するための圧縮可能な多孔質部材と、
 該多孔質部材に保持されたインクを前記記録手段へ供給するためのインク供給口と、
 該インク供給口と多孔質部材とを連通させるインク供給路と、
 該インク供給路の端部に設けられたフィルタと、
 該フィルタの周辺部を非固定状態で支持するフィルタ支持部と、
 前記多孔質部材の弾性変形力により前記フィルタを前記フィルタ支持部に対して圧接させる多孔質部材の変形規制部材と、を有することを特徴とするインクタンク。

【請求項2】 前記フィルタ支持部は、前記フィルタの位置を規制するための突出部を有し、該突出部の突出量は前記フィルタの厚さよりも少ないと特徴とする請求項1に記載のインクタンク。

【請求項3】 前記フィルタ支持部と前記フィルタとの間には、環状の弾性部材が配されることを特徴とする請求項1に記載のインクタンク。

【請求項4】 記録手段にインクを供給するためのインク供給口を有するインクタンクに対するフィルタ取付方法であって、
 前記インク供給口に連通するフィルタ支持部にフィルタを載置し、
 インクを保持するための多孔質部材をインクタンク内に挿入して該多孔質部材を圧縮し、
 該圧縮に対する弾性変形力で前記フィルタを前記フィルタ支持部に圧接させ、前記フィルタ支持部に前記フィルタを取付ることを特徴とするフィルタ取付方法。

【請求項5】 前記フィルタ支持部に環状の弾性部材を介した状態で前記フィルタを載置することを特徴とする請求項4に記載のフィルタ取付方法。

【発明の詳細な説明】

【0001】

【産業上の利用分野】 本発明は、被記録媒体に対して複数のオリフィスから画像情報に応じてインクを吐出し、画像を形成する記録手段に供給するためのインクを収容するものであって、フィルタを有するインクタンク及び該インクタンクに対するフィルタ取付方法に関し、特に、インクを保持するために多孔質部材を用いるインクタンク及び該インクタンクに対するフィルタ取付方法に関する。

【0002】

【従来の技術】 インクを吐出する記録手段を用いて画像等を記録する方式は、比較的記録装置を安価に製造できるため、近年主流となっている。この方式は、記録手段としてインクジェットヘッドを用いて、被記録媒体に複数のオリフィスから画像情報に応じて液滴を吐出するこ

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とで、画像を形成するものである。

【0003】 このインクジェットヘッドは、前記複数のオリフィスに連通する複数のノズルと、前記複数のノズルと共に連通する共通液室と、前記共通液室にインクを供給するインクタンクとにより構成されるのが一般的である。また、記録手段の小型化という観点から、前記複数のノズル内には液滴を吐出するエネルギー発生体として、発熱抵抗体が設けられることが多い。

【0004】 そして、インクジェットヘッドにインクを供給するインクタンクには、インクを吐出するオリフィスからのインク漏れを防止するために、記録手段に対して背圧を発生させる手段を内部に設ける構成としている。

【0005】 この背圧発生手段としては、収容されたインクがメニスカスを形成して背圧を発生するように、多孔質となっている多孔質部材をインク収容部に配する構成が挙げられる。なお、通常この背圧発生手段は、記録手段における圧力状態を大気圧よりも低い状態、すなわち大気圧に対して負の圧力とする場合には負圧発生手段と称される。

【0006】 前述したように、負圧発生手段として多孔質部材が使われることが多いが、この場合には多孔質部材から微細片が出て、保持しているインク内に混じる可能性が高いため、通常のゴミ等を除去する目的もあわせて外部へのインク導出経路中にフィルタを設けることになる。このフィルタにより、記録手段側へ微細なゴミ等が侵入することを防ぐことができ、吐出部における目詰まりを引き起こすことを抑制できる。

【0007】 このフィルタは、インクタンク内部において記録手段へインクを供給するためのインク供給口部に装着され、フィルタを支持するフィルタ支持部に、フィルター周囲に当接する箇所に設けられた突起部を、熱又は超音波により溶かすことによりフィルタを溶着していた。

【0008】 また、フィルタ部の固定部の密着性を向上させるための方法として、特公平6-39164号公報に示されるように、フィルタをインクタンクに設けられたフィルタ支持部とフィルタ押え部材で挟み込み、双方を溶融させて固定する方法も提案されている。

【0009】

【発明が解決しようとしている課題】 しかしながら、上述した従来例では、フィルタを固定するために溶着という手法を用いているために、溶着のための突起部が構成されているインクタンクの材質が、熱又は超音波による溶着に最適な熱加塑性を持つ高分子材料に限定されるという技術的な制約が生じていた。

【0010】 また、ガラス、金属等のフィラーが混入されている材料の場合、熱又は超音波による溶着時に溶着端子の摩耗、ヤケなどが発生する為に安定な生産ができないという課題があった。

【0011】さらに、溶着時に一定の時間を要する為に生産時間が長く、コスト上昇のおそれがあった。

【0012】加えて、フィルタを溶着により固定する場合、フィルタ支持部からのフィルタの浮きなどに起因する間隙から気泡等の侵入を防止するために、フィルタ周囲の溶着は確実に行う必要がある。

【0013】このため、フィルタ周辺部において、フィルタと多孔質部材とが圧接するフィルタ表面よりも溶着部が突出する構成となることが多く、この場合には、フィルタ周辺部において多孔質部材との間に間隙が生じることとなる。このフィルタと多孔質部材との間の間隙は、気泡等が滞留しやすい領域となるため、インク供給時の有効流路径の減少やインク供給量の変動等によりインクの安定な供給が困難になるおそれがある。

【0014】本発明の目的は上記問題点を解決し、インクタンク材質が限定されない、インク供給性能の安定した、生産性の良好なインクタンク及びこのインクタンクへのフィルタの取付方法を提供することにある。

【0015】

【課題を解決するための手段】本発明は、前述した課題を解決するために、記録手段に供給するためのインクを収容するインクタンクにおいて、インクを保持するための圧縮可能な多孔質部材と、該多孔質部材に保持されたインクを前記記録手段へ供給するためのインク供給口と、該インク供給口と多孔質部材とを連通させるインク供給路と、該インク供給路の端部に設けられたフィルタと、該フィルタの周辺部を非固定状態で支持するフィルタ支持部と、前記多孔質部材の弾性変形力により前記フィルタを前記フィルタ支持部に対して圧接させる多孔質部材の変形規制部材と、を有する構成とすることを提案するものである。

【0016】そして、上記構成に加え、前記フィルタ支持部に、前記フィルタの位置を規制するための突出部を有し、該突出部の突出量を前記フィルタの厚さよりも少なくする構成、または、前記フィルタ支持部と前記フィルタとの間に、環状の弾性部材が配する構成を提案するものである。

【0017】また、上記構成以外に、記録手段にインクを供給するためのインク供給口を有するインクタンクに対するフィルタ取付方法として、前記インク供給口に連通するフィルタ支持部にフィルタを載置し、インクを保持するための多孔質部材をインクタンク内に挿入して該多孔質部材を圧縮し、該圧縮に対する弾性変形力で前記フィルタを前記フィルタ支持部に圧接させ、前記フィルタ支持部に前記フィルタを取付るフィルタ取付方法も提案するものである。

【0018】そして、上述方法に対してさらに、前記フィルタ支持部に環状の弾性部材を介した状態で前記フィルタを載置する工程を加えた方法も提案するものである。

【0019】

【作用】上述した手段を用いることにより、インクタンクへのフィルタの取付を溶着を用いずに、フィルタ支持部に圧接させることができ、さらに、多孔質部材がフィルタのインクタンク内部側表面全体と確実に密着することができる。

【0020】

【実施例】以下に本発明の実施例を図面を用いて、詳細に説明する。なお、各図において、同一符号を付した要素は、同一または同様の機能を有するものとする。

【0021】図1は、本発明に係わるインク収容部を有するインクジェット記録装置の一例を示す概略外観図である。図1において、1はフィルタを有するインク収容部を備えたインクジェットヘッドである。2はインクジェットヘッド1を吐出口面を下向きにして固定するキャリッジである。

【0022】また、3は記録が行われる被記録媒体であり、本実施例では記録紙を用いている。この記録紙3は、プラテン4によりインクジェットヘッド1の走査方向と垂直方向に搬送される。5、6はキャリッジ2走査するためのシャフトであり、5の回転によりキャリッジ2が移動する。

【0023】そして、7はインクジェットヘッド1の吐出口面を覆うキャップであり、非印字時のインクジェットヘッド1の待機中に吐出口面を覆うように構成されている。8はキャップ7を介してインクジェットヘッド1内の複数のオリフィスからインクを吸引する為のポンプである。

【0024】以上のような構成を持つインクジェット記録装置により、記録紙3上に、インクジェットヘッド1内の複数のオリフィスから液滴を吐出することで画像が形成される。

【0025】(第1実施例)図2に本発明の第1実施例として、記録手段とインク収容部とを有するインクジェットヘッドの断面図を示す。図2において、12は液滴を形成する為のエネルギー発生部である複数のヒーターが形成されているヒーターボードである。13は内部に複数のノズル、及び前記複数のノズルに連通する共通液室、さらに前記共通液室に連通するインク供給口を持つ天板である。11は基板であり、基板11上にヒーターボード12、天板13が固定されている。

【0026】そして、基板11、ヒーターボード12、天板13により、記録手段としての被記録媒体に複数のオリフィスから液滴を吐出して画像を形成する液滴形成部を構成する。

【0027】また、14は前記液滴形成部にインクを供給し、保持するためのインク収容部としてのインクタンクである。10はインク収容部内のインクをインク収容部外へ導出するためのインク供給口である。インクタンク14内には、前述したように、負圧を発生しインクを

保持する機能を持つ圧縮された多孔質部材15と、インク供給口10とを連通させるインク供給路10aの端部に位置するように前記インク中のゴミを除去する機能を持つフィルタ16とが備えられている。

【0028】ここで、多孔質部材15はウレタンもしくはメラミン系の材質を用いた弾性体である多孔質部材を、圧縮しつつインクタンク14内に挿入することで形成されている。また、フィルタ16は平面状のSUSの細線を編み込んだメッシュフィルタ、もしくはSUSの細線のバルクをプレスし、焼結したフィルタが用いられている。

【0029】フィルタ16はインクタンク14内に形成された、天板13に連通するインク供給口部17の上面を覆う位置となるフィルタ支持部18に置かれており、前記の圧縮された多孔質部材15により加圧状態でインクタンク14内のインク供給口に密接するように固定されている。この際フィルタ16のインクタンク14との接着、溶着などの固着工程は無い。

【0030】また、フィルタ支持部18もフィルタ16と同様の平面形状をしており、フィルタ径よりも大きな径を有している。これは、多孔質部材15のフィルタ16に圧接する領域にわたって圧力状態を均一とするためであり、特にフィルタ周辺部において多孔質部材の圧縮分布が変化しないようにしている。

【0031】ここで、多孔質部材15はフィルタ取付部であるフィルタ支持部18に対向するインクタンクの壁19により圧接方向の圧力状態が維持される構成となっている。従って、本実施例においては、壁19が多孔質部材15の主な変形規制部材として機能している。

【0032】また、図に示したように、フィルタ支持部18をインクタンク内部に突出させる構成とし、突出部全体を覆うように多孔質部材15を配してフィルタ16を押圧している。

【0033】そして、この加圧状態は、インクタンク14の内容積と多孔質部材15の大きさにより調整されるが、安定した負圧発生とフィルタ16の位置固定を両立するために、多孔質部材15とフィルタ16との圧接面から対向する壁までの距離をhとすると、多孔質部材15の同一方向（もしくはフィルタ押圧軸方向）の幅を1.5h～6hの範囲内としてフィルタ16に対する押圧力を3000～15000N/m²とすることが望ましい。本実施例においては、多孔質部材15の幅を3hとして、フィルタ16に対して7500N/m²の押圧力が働くようにしている。

【0034】また、前述した壁19にリブ20を設けてフィルタの圧接力の微調整を行うとともに、フィルタ16にかかる多孔質部材15の弾性変形力による押圧力のベクトルをフィルタ16の表面に対する法線方向とほぼ等しくなるように規制している。これにより、変形の規制をさらにインク供給に適切な状態に調整している。

【0035】上述の構成を採用することにより、多孔質部材15とフィルタ16との圧接部において間隙が生じることはなく、フィルタ16に対して多孔質部材15が確実に密着するので、フィルタ近傍に気泡が集まることによりインク供給流路の有効径を減少させることは無い。

【0036】また、落下等による振動が加わり、インクタンク内部において、多孔質部材15が内部に保持したインクの自重による影響により微少な変位をしたとしても、フィルタ16が非固着状態であるため、その変位に伴ってフィルタ16もフィルタ支持部18上で多少の移動は可能となる。従って、多孔質部材15とフィルタ16との間のねじれ等が生じることはなく、衝撃等により気泡がフィルタ16の近傍に滞留する可能性をより低いものとできる。

【0037】（第2実施例）図3は、本発明に係わる第2実施例としてのフィルタ部を示す概略断面図である。図3において、31はインクタンク内に形成された、液滴形成部にインクを供給する為のインク供給口部である。32はインクタンク内に挿入された、負圧を発生しインクを保持する機能を持つ圧縮された多孔質部材である。33はインク中のゴミを除去する機能を持つフィルタである。

【0038】そして、前述した第1実施例と同様に、多孔質部材32はウレタンもしくはメラミン系の材質を用いた弾性体である多孔質部材を、圧縮しつつインクタンク14内に挿入することで形成されている。また、フィルタ33は平面状のSUSの細線を編み込んだメッシュフィルタ、もしくはSUSの細線のバルクをプレスし、焼結したフィルタが用いられている。

【0039】ここで、フィルタ33はインク供給口部31の上面を覆うように、フィルタ支持部38上の所定位に置かれており、前記の圧縮された多孔質部材32により加圧状態でインクタンク内のインク供給口に密接するように固定されている。

【0040】この際、位置決め用の突出部であるリブ34は、フィルタ33の水平方向の固定位置がインク供給口部の中心から大きく外れる事がないようにする為に、また組立時のフィルタ33の位置決めを容易にする為に、インク供給口部31の上部の周囲に設けられている。また、フィルタ33の密着性を良好にする為に、位置決め用のリブ34の厚みはフィルタ33の厚みより少なく設定され、結果としてリブ34の高さは、フィルタ33の圧接側表面よりも低くなっている。

【0041】これにより、第1実施例と同様にフィルタ33と多孔質部材32との密着性は維持され、さらにフィルタ33の位置精度を向上することができる。

【0042】そして、突出部34とフィルタ33の端部との間に間隔を設けることにより、前述したような衝撃等に起因する多孔質部材32の変位を許容できるとともに

に、インク供給に影響を与えない程度にフィルタ33の変位を抑えることも可能となる。

【0043】(第3実施例)図4に本発明に係わる第3の実施例としてのフィルタ部の取付形態を示す。図4において、41はインクタンク内に形成された、液滴形成部にインクを供給する為のインク供給口部である。42はインクタンク内に挿入された、負圧を発生しインクを保持する機能を持つ圧縮された多孔質部材である。43はインク中のゴミを除去する機能を持つフィルタである。

【0044】フィルタ43はフィルタ支持部48に対して、インク供給口部41の上面を覆う位置に置かれており、前記の圧縮された多孔質部材42により加圧状態でインクタンク内のインク供給口に密接するように固定されている。この際、フィルタ43のインク供給口部41との気密性を良好にする為に、インク供給口部41の上部には、中央部のインク供給部が除去されて環状となった平面状の弾性部材44が配置され、弾性部材44の上部にフィルタ43が配置されている。弾性部材44はブチルゴム等が使用される。

【0045】ここで、フィルタ43への押圧力に対して、弾性部材44が塑性変形を生じない程度の弾性係数等の特性を有する材料とすることが好ましい。

【0046】この弾性部材44を設けることにより、多孔質部材42によるフィルタ43への押圧力のベクトルが、衝撃等の外力によりフィルタ43の表面に対する法線方向に対して一時的にずれたとしても、初期状態に復帰するまで気密性を維持することができる。

【0047】(第4実施例)さらに、図5に本発明に係わる他の実施例としてのフィルタ部を示す。本実施例は、前述した第2実施例と第3実施例とを組み合わせ、より気密性の良いフィルタ取付形態を提案するものである。

【0048】図5において51はインクタンク内に形成された、液滴形成部にインクを供給する為のインク供給口部である。52はインクタンク内に挿入された、負圧を発生しインクを保持する機能を持つ圧縮された多孔質部材である。53はインク中のゴミを除去する機能を持つフィルタである。

【0049】フィルタ53はフィルタ支持部58に対してインク供給口部51の上面を覆う位置に置かれており、前記の圧縮された多孔質部材52により加圧状態でインクタンク内のインク供給口に密接するように固定されている。

【0050】この際、フィルタ53のインク供給口部51との密着性を良好にする為に、インク供給口部51の上部には、中央部のインク供給部が除去された平面状の弾性部材54が配置され、弾性部材54の上部にフィルタ53が配置されている。

【0051】さらに、位置決め用のリブ55は、フィル

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タ53及び弾性部材54の水平方向の固定位置がインク供給口部の中心から大きく外れる事がないようにする為に、また組立時のフィルタ53及び弾性部材54の位置決めを容易にする為に、インク供給口部51の上部の周囲に設けられている。また、フィルタ53の密着性を良好にする為に、位置決め用のリブ55の厚みはフィルタ53と弾性部材54との厚みより低く設定されている。

【0052】これにより、フィルタ53と多孔質部材52との密着性を高くするとともに、フィルタ53とフィルタ支持部58との間の気密性を維持することが可能となる。

【0053】

【発明の効果】以上に述べてきたように、本発明では、インクを保持するための多孔質部材とフィルタとの圧接部において間隙が生じることはなく、フィルタに対して多孔質部材が確実に密着するので、フィルタ近傍に気泡が集まることによりインク供給流路の有効径を減少させることはない。

【0054】また、落下等による振動が加わり、インク20タンク内部において、多孔質部材が内部に保持したインクの自重による影響により微少な変位をしたとしても、フィルタが非固着状態であるため、その変位に伴ってフィルタもフィルタ支持部上で多少の移動は可能となる。従って、多孔質部材とフィルタとの間のねじれ等が生じることはなく、衝撃等により気泡がフィルタの近傍に滞留する可能性をより低いものとできる。

【0055】そして、インクタンク材質が限定されない、生産性の高いインクタンクとこのインクタンクへのフィルタの取付方法を実現し、低コストのインクタンク30を生産することと共に、フィルタの密着性が高くゴミ除去性の良好な、信頼性の高いインクタンクを生産することが可能となる。

【0056】また、ガラス、金属等のフィラーが混入されている材料を用いることができる、インクタンクを取り外し可能とした際の係合部の強度を高くして、着脱を繰り返した場合の係合部の摩耗を少なくすることも可能となる。

【図面の簡単な説明】

【図1】本発明に係わるインク収容部を有するインクジエット記録装置の一例を示す概略外観図である。

【図2】本発明に係わる第1実施例としての記録手段とインク収容部とを有するインクジェットヘッドの概略断面図である。

【図3】本発明に係わる第2実施例としてのフィルタ部を示す概略断面図である。

【図4】本発明に係わる第3実施例としてのフィルタ部を示す概略断面図である。

【図5】本発明に係わる第4実施例としてのフィルタ部を示す概略断面図である。

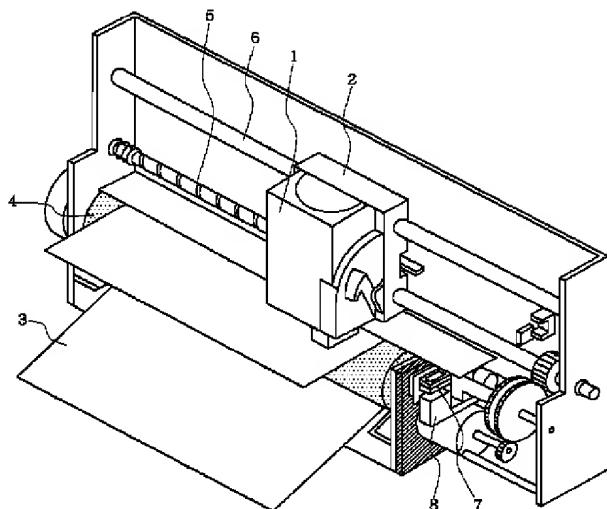
【符号の説明】

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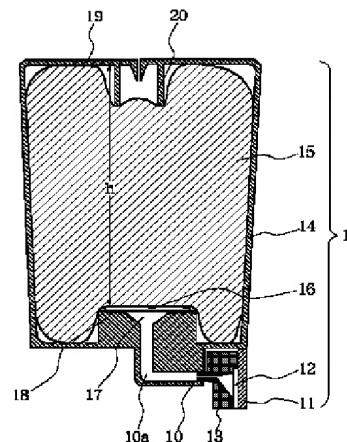
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1 インクジェットヘッド	19 壁
2 キャリッジ	20 リブ
3 記録紙	31 インク供給口部
4 プラテン	32 多孔質部材
5 シャフト	33 フィルタ
6 シャフト	34 リブ(突起部)
7 キャップ	38 フィルタ支持部
8 ポンプ	41 インク供給口部
10 インク供給口	42 多孔質部材
10a インク供給路	43 フィルタ
11 基板	44 弹性部材
12 ヒータボード	48 フィルタ支持部
13 天板	51 インク供給口部
14 インクタンク(インク収容部)	52 多孔質部材
15 多孔質部材	53 フィルタ
16 フィルタ	54 弹性部材
17 インク供給口部	55 リブ(突起部)
18 フィルタ支持部	58 フィルタ支持部

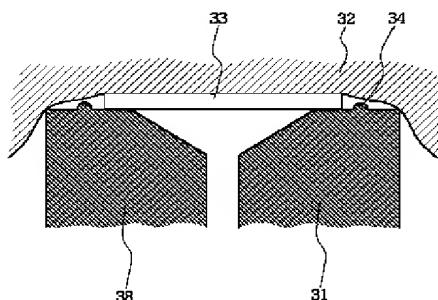
【図1】



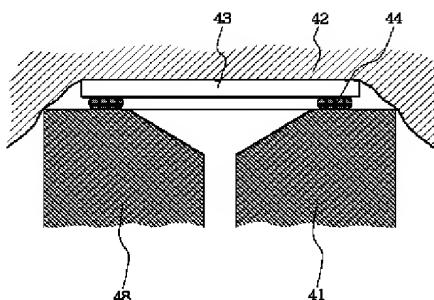
【図2】



【図3】



【図4】



【図 5】

